Space Weather Forecast

Issued on Wednesday, 27 September 2023 at 13:08 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Chance of Moderate flares (R1-R2 Radio blackouts) throughout. A diminishing slight chance of G1 minor geomagnetic storms at first Day 1 (27 Sep).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low, with the largest flare a mid-level Common-class flare observed at 27/0546UTC originating from a region just beyond the southeast limb.
There are currently seven sunspot regions on the visible disc, with five of these located in the western hemisphere. There are three moderately large bipolar regions, one in the northwest quadrant, and two in the southwest, with the southernmost group having the more complex magnetic structure at present. Remaining regions are generally simple and unremarkable.

No potential Earth-directed CMEs have been observed in the past 24hrs.

Solar Wind / Geomagnetic Activity: Solar winds have been at slightly elevated to elevated levels, in the range 450-530 km/s. Winds rose to peak in the first half of the period, before reducing gradually after midnight UTC. This increase may have been the result of some connection to a coronal hole in the northwest. The Interplanetary magnetic field (IMF) was weak, with the north-south component weakly variable, although often negative (southward). Resultant geomagnetic activity started at G1/Minor Storm (Kp 5) levels, then became Unsettled to Active (Kp 3-4) from 26/1500UTC before subsiding to Quiet (Kp 1-2) on the most recent observations.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no Solar Radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be generally Low, but with a chance of Moderate flares, and a slight chance of isolated Strong flares, most likely from the larger sunspot regions in the western hemisphere.

Solar Wind / Geomagnetic Activity: A possible glance from weak CME arrivals cannot be ruled out at first on Day 1 (27 Sep), however this is deemed very low confidence.

Solar winds are expected to start at slightly elevated levels at first, most likely as a result of the waning influence of a coronal hole in the northwest. Solar winds are expected to gradually drop back to more ambient levels with no other obvious coronal holes predicted in the forecast period. Geomagnetic activity is expected to be largely be Quiet to Unsettled (Kp 2-3), with a slight chance of Active or G1/Minor Storm (Kp 5) intervals at first on Day 1 (27 Sep) due to any possible further glancing CME effects. Quiet to Unsettled (Kp 1-3) activity is then expected to dominate from later Day 1 (27 Sep) through the rest of the period. However, a further enhancement is possible during Day 2 (28 Sep) with another potential glancing CME, but this is

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

very low confidence.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain generally at background levels, but with a slight chance of Solar Radiation storms.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Met Office

Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	15	15	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.